

The BELARE 2019-2020 meteorite recovery expedition on the Nansen Ice Field, East Antarctica

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Introduction: The first Asuka meteorites were found by accident in 1986 by a glaciological party of JARE on bare ice fields near Mt. Balchen [1]. During the 1987-1988 and 1988-1989 field seasons, JARE-29 and JARE-30 team members visited the Nansen and Balchen Ice Fields and recovered nearly 2,000 meteorites [2,3]. Following this expedition, the nomenclature committee of the Meteoritical Society designated this region as an official meteorite dense collecting area, naming the meteorites Asuka after the former Japanese research station in this area. For convenience, three areas have been defined on the Nansen Ice Field: area A, B, and C. Area A was searched by BELARE 2010-2011 and a total of 218 meteorites were collected [4]. The JARE-54/BELARE 2012-2013 joint expeditions team conducted a search for meteorites on Area B and the northern part of Area C [5]. Thus, the BELARE 2019-2020 meteorite research and recovery expedition took place between the 15 January and the 6 February 2020 within the remaining southern part of the Area C which had not been searched in over 30 years. This expedition team consisted of four researchers from Belgian, Turkish and Japanese institutes, and two field guides.

Meteorite search: The location of our base camp was set up on Area C of the Nansen Ice Field (S72.79754° E24.86002°). Twenty-two days were spent on the Nansen Ice Field, while meteorite searches were only possible during twelve days due to the weather conditions. In the case of good weather, the usual departure time was around 10:00. After arrival at the targeted search area, the team members took their designated position, forming a V-shaped configuration with each member in a fixed position and one field guide at the apex of the V-formation. The field guide then followed predetermined GPS tracks in a zigzag pattern. Following previous campaigns, working and searching in this pattern provides the highest surface coverage as well as maximum safety.

The same procedure for collecting meteorites described by Imae et al. [5] was used in this expedition. When a meteorite was found, the field sample number consisting of the initial of the finder's last name, the year, month, day and the number of the meteorite found on that day by the member (e.g., Y20012501) was written with a marker pen on the surrounding ice/snow near the meteorite. Photos of the meteorite were taken from various angles. Then, the meteorite was picked up using zip lock polyethylene bags while avoiding any direct contact. In case carbonaceous chondrites were identified in the field, these meteorites were placed in Teflon bags instead of regular polyethylene zip lock bag due to possible contamination of organic compounds from polyethylene bag. Finally, the location of the recovered meteorite was recorded using a handheld GPS unit.

Preliminary results: In total 65 meteorites were collected. The total weight of the meteorites was determined to be ~8 kg, individual specimens range from 1.7 g to 879 g. The collected meteorites include carbonaceous chondrites, ordinary chondrites and achondrites (notably HED meteorites), as identified in the field based on their macroscopic characteristics and magnetic susceptibilities. These meteorites will be referred to as Asuka 19 meteorites. In addition to meteorites, blue ice samples, volcanic ash layers and wind-blown terrestrial rock fragments were collected in order to study in detail the nature of the mechanisms concentrating meteorites on the Nansen Ice Fields.

The collected meteorites were securely packaged and transported in frozen state to the NIPR for dry-thawing and subsequent classification. Each meteorite will be shared between Japan and Belgium. The newly collected meteorites will be presented to the Meteorite Nomenclature Committee of the Meteoritical Society for approval, after which their classification will be published in the Meteorite Newsletter and the Meteoritical Bulletin database.

References: [1] Nishio F. et al. 1987. *Antarct. Meteorit.* XII, 1-2. [2] Naraoka H. et al. 1990. *Antarct. Rec.* **59**: 216-224. [3] Yanai K. 1993. *Proc. NIPR Symp Antarct. Meteorit.* 6, 148-170. [4] Goderis S et al. 2011. *Antarct. Meteorit.* XXXIV, 12. [5] Imae N. et al. 2012 *Antarct. Rec.* **59**: 38-72.